

What is claimed is:

1. A system of evaluating a leak detection test performed on a headspace of a fuel system supplying fuel to an internal combustion engine of a vehicle, the system comprising:
 - a fuel vapor pressure management apparatus including:
 - a housing defining an interior chamber;
 - a pressure operable device separating the interior chamber into first and second portions, the pressure operable device including a poppet movable along an axis and a seal adapted to cooperatively engage the poppet, a first arrangement of the pressure operable device occurs during the leak detection test when there is a first negative pressure level in the first portion relative to the second portion and the seal is in a first deformed configuration, a second arrangement of the pressure operable device permits a first fluid flow from the second portion to the first portion when the seal is in a second deformed configuration, and a third arrangement of the pressure operable device permits a second fluid flow from the first portion to the second portion when the seal is in an undeformed configuration; and
 - a sensor detecting the first arrangement of the pressure operable device during the leak detection test; and
 - a processor that (1) calculates an in-use rate value by dividing a number of monitoring events by a number of driving events of the vehicle, the number of monitoring events being based on the sensor detecting the first arrangement; and (2) compares the in-use rate value to a standard value.
2. The system according to claim 1, wherein the sensor detecting the first arrangement comprises at least one of a switch contacted by the movement of the poppet and a proximity sensor detecting the movement of the poppet.
3. The system according to claim 1, further comprising:
 - a memory storing the number of monitoring events and storing the number of driving events.

4. The system according to claim 1, further comprising:
a system malfunction indicator coupled to the computer, the system malfunction indicator is actuated in response the computer determining that the in-use rate value is less than the standard value.
5. The system according to claim 4, wherein the standard value comprises 0.336.
6. The system according to claim 1, further comprising:
a temperature sensor detecting a temperature decrease of at least one of a temperature of fuel vapor in the headspace and a temperature that correlates to the fuel vapor in the headspace.
7. The system according to claim 1, further comprising:
a control unit for the internal combustion engine, the control unit electrically communicating with the processor.
8. The system according to claim 7, wherein the processor and the control unit are integrated within a common case.
9. The system according to claim 7, wherein the processor stands alone from the control unit.
10. The system according to claim 9, wherein the processor is integrated within the housing.
11. A method of evaluating a leak detection test performed on a headspace of a fuel system supplying fuel to an internal combustion engine of a vehicle, the system comprising:
performing the leak detection test with a fuel vapor pressure management apparatus including:
a housing defining an interior chamber;
a pressure operable device separating the interior chamber into first and second portions, the pressure operable device including a poppet movable along an axis and a seal adapted to cooperatively engage the poppet, a first arrangement of the pressure operable device occurs during the leak detection

test when there is a first negative pressure level in the first portion relative to the second portion and the seal is in a first deformed configuration, a second arrangement of the pressure operable device permits a first fluid flow from the second portion to the first portion when the seal is in a second deformed configuration, and a third arrangement of the pressure operable device permits a second fluid flow from the first portion to the second portion when the seal is in an undeformed configuration; and

a sensor detecting the first arrangement of the pressure operable device during the leak detection test;

calculating an in-use rate equal to a number of monitoring events divided by a number of driving events; and

comparing the calculated in-use rate to a standard value.

12. The method according to claim 11, wherein the calculating comprises incrementing the number of driving events when 1) the internal combustion engine operation is initiated from a cold start, 2) the internal combustion engine runs a minimum of ten minutes, 3) the vehicle accumulates a minimum of five minutes of operation at a minimum of 25 miles per hour, 4) the internal combustion engine idles a minimum of 30 seconds, 5) the internal combustion engine operation is in an ambient temperature between 40 degrees Fahrenheit and 95 degrees Fahrenheit, and 6) the internal combustion engine operates at an altitude below 8000 feet.

13. The method according to claim 12, wherein the calculating comprises incrementing the number of monitoring events according to at least one of a statistical method and a decay method.

14. The method according to claim 13, wherein the calculating comprises incrementing the number of monitoring events according to the statistical method when, within a twenty-four hour period, the internal combustion engine is operated a minimum of one occurrence and the internal combustion engine operation includes a hot soak lasting a minimum of two hours.

15. The method according to claim 14, further comprising:
indicating a system malfunction when a predetermined number of unsuccessful twenty-four hour tests occur in series.
16. The method according to claim 15, wherein the predetermined number comprises a minimum of five unsuccessful twenty-four hour tests.
17. The method according to claim 13, wherein the calculating comprises incrementing the number of monitoring events according to the decay method, including detecting a temperature decreases of a minimum of four degrees Celsius for a minimum of two hours.
18. The method according to claim 17, wherein the temperature comprises at least one of a temperature of fuel vapor in the headspace and a temperate that correlates to the fuel vapor in the headspace.